

# HEMOGLOBIN ADDUCTS IN CORD BLOOD FROM ACRYLAMIDE, ITS METABOLITE GLYCIDAMIDE AND BIRTH OUTCOMES

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**Background and Aims:** Acrylamide is a potential human carcinogen and neurotoxicant that crosses the human placenta. Some reproductive and developmental toxicity of acrylamide have been observed in rodents, yet evidence is limited and no human data exist. We examined the effects of hemoglobin adducts from acrylamide in cord blood, as well as its mutagenic and genotoxic metabolite glycidamide, on birth outcomes in the NewGeneris (Newborns and Genotoxic exposure risks) study population.

**Methods:** Included in this study were infants born to women with singleton pregnancies (N=1096) from Greece, Norway, Spain, Denmark and the United Kingdom. Cord blood adducts were simultaneously determined by the “adduct FIRE procedure” using liquid chromatography–tandem mass spectrometry (LC–MS/MS).

**Results:** Acrylamide exposure was associated with a significant decrease in birth weight. In linear regression models adjusted for gestational age and country of birth, the difference in mean birth weight for infants in the highest quartile of acrylamide adduct concentrations compared with that of infants in the lowest quartile was -127 gram (SE: -41; p=0.006, n=1096); this difference was similar in infants born to self-reported non-smokers ( $\beta$ : -115 gram; SE: -42; p=0.006, n=941) and for glycidamide adducts. No major changes in these associations were observed when self-reported maternal smoking, exposure to ETS, maternal age, pre-pregnancy BMI, and gender were included as additional covariates. High acrylamide exposure were also associated with increased odds ratios for small size for gestational age (birth weight <10th population centile taking into account week of gestation) and reduced head circumference.

**Conclusions:** This study is the first to evaluate the relationships between cord blood hemoglobin adducts from acrylamide and birth outcomes. As the associations between biomarkers of acrylamide exposure and reduced birth weight appeared in infants born to non-smokers, these results are likely to be associated to intake of less healthy food.